



RESPONSES OF RICE FARMERS ENGAGED IN VEGETABLE PRODUCTION: IMPLICATIONS OF THE COLLAPSE OF VEGETABLE PRICES IN THE FOGERA PLAIN

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Research Note
Issue 4, July 2021

1 Introduction

Rice is a relatively recent introduction to Ethiopia. During the Derge regime, that ruled the country from 1974 to 1991, the promotion of rice production was one intervention that was introduced to address famine-related challenges. Rice was first introduced in Gambella (1973–1982), Pawe (1985–1988), and the Fogera Plain (early 1980s). To this day, Fogera has remained one of the country's major rice production areas, and has experienced huge changes in agrarian relations and social dynamics associated with the introduction of rice and its subsequent commercialisation (Alemu and Thompson, 2020).

Before the introduction and expansion of rice production in the Fogera Plain, Fogera district (one of the four districts in the Fogera Plain) was considered to be food insecure. Since the 1980s, rice production has continued to increase; not only in the lowland where waterlogging was a problem but also in upland areas thanks to the introduction of upland rice varieties. As a result, local people have a saying that due to rice “*wuhaw belagn* is changed to *wuha abelagn*” (“the water that ate us is changed to the water that fed us”) due to the opportunities that rice has offered to produce under waterlogged conditions. Expanding rice production also significantly contributed to the Fogera Plain being classed as food secure in 2005.

One of the outcomes of increased surplus production, and therefore rice commercialisation, has been the ability of smallholder rice farmers to intensify their production through diverse investments, mainly in supplementary irrigation. This has also enabled rice farmers to diversify

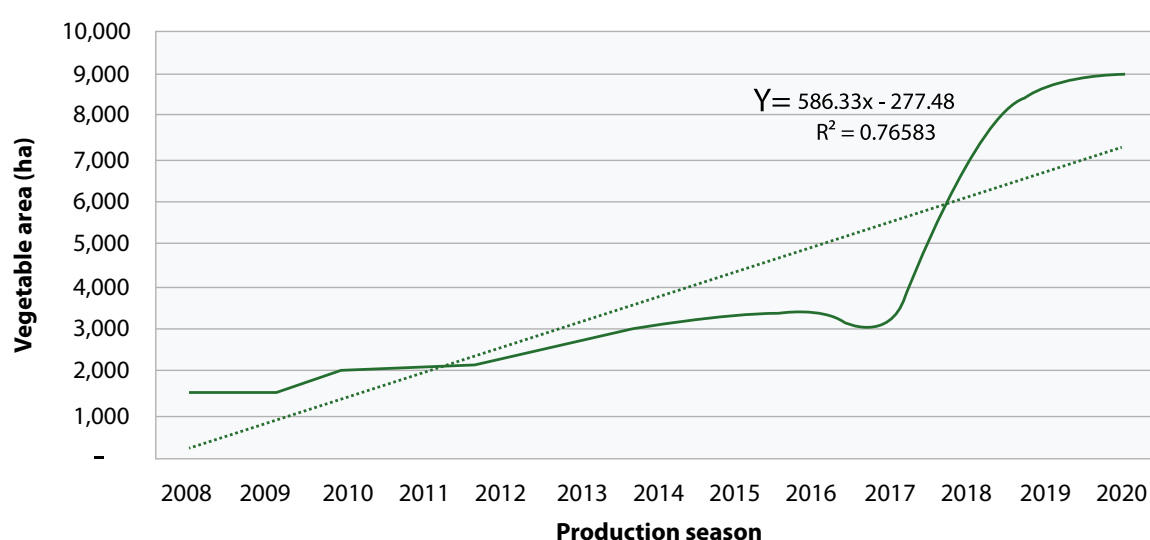
crop production, mainly during the off-season, through the production of high-value crops like vegetables. As a result, Fogera Plain has become one of the major vegetable production areas in the region. Onion grown under supplementary irrigation has especially become an important commodity that is diversifying incomes.

Despite this expansion, a recent visit to the Fogera Plain by the authors revealed that most smallholder rice farmers were not able to sell their onions due to the collapse of local markets as a result of: (i) the challenges posed by COVID-19-related restrictions, (ii) the poor overall performance of Ethiopia's vegetable marketing system, including the lack of a market information system, adequate marketing infrastructure, lengthy supply chains and the presence of middlemen (locally called *delalas*) who receive the largest share of the price margin, (iii) inadequate market regulation capacity, and (iv) the bulkiness and perishability of vegetable products (de Roo and de Boef, 2020; Mekasha and Tirfe, 2019). To investigate this collapse further, the authors investigated farmer investments in producing onion, their responses to the collapse of the onion market, and the implications for rural livelihood improvement within the Fogera Plain.

2 The importance of vegetable production in the Fogera Plain

With increased income from rice production and its commercialisation, rice farmers in the Fogera Plain have diversified their production to different vegetable crops. The major vegetable crops grown in the Fogera Plain are onion, tomato, shallot, garlic, pepper, potato, cabbage, beetroot and carrot. Taking into consideration

Figure 1 Trends in land allocation for vegetable crops in Fogera district



Source: Fogera District Office of Agriculture

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only Fogera district, the trend in land use for vegetable production has increased considerably and has demonstrated an average annual growth of 16.08 per cent over the last decade (Figure 1).

3 Irrigation investment of smallholder rice farmers

Vegetable production in the area is mainly through irrigation using groundwater and surface water. Most vegetable producers use motor pumps to irrigate the land. This implies that the main investments for irrigation are preparation of groundwater, surface water and purchase of water pumps. The case in Fogera district indicates that of all of the farmers with access to irrigation, about 32 per cent use ground water (deep wells and shallow wells), about 65 per cent use surface water (lakes, rivers and streams,) and about 3 per cent use both sources of irrigation water.

Focus group discussions with rice farmers indicated that on average the cost of a single groundwater source for irrigation ranges from 6,000 to 11,000 ETB. This cost varies depending on the depth and the diameters of the water source. Sources of groundwater are often dug by local labourers with traditional skills. Once the groundwater source is ready, there are two options to get the water out for irrigation. The first option is to use a water motor pump and the second is to manually lift the water using a bucket connected with rope. In general, most farmers use a motor pump to irrigate vegetable crops given the relatively large plot sizes.

The price of a motor pump varies depending on the brand, the capacity in terms of horsepower (HP) of the motor, and the engine type. In early 2021, the average motor pump price ranged from 7,000 to 15,000 ETB. There are also additional costs involved in irrigation

including fuel and labour. Thus, the cost of production of onion using irrigation requires an initial investment in the development of groundwater, the purchase of a motor pump and the variable costs of fuel and labour.

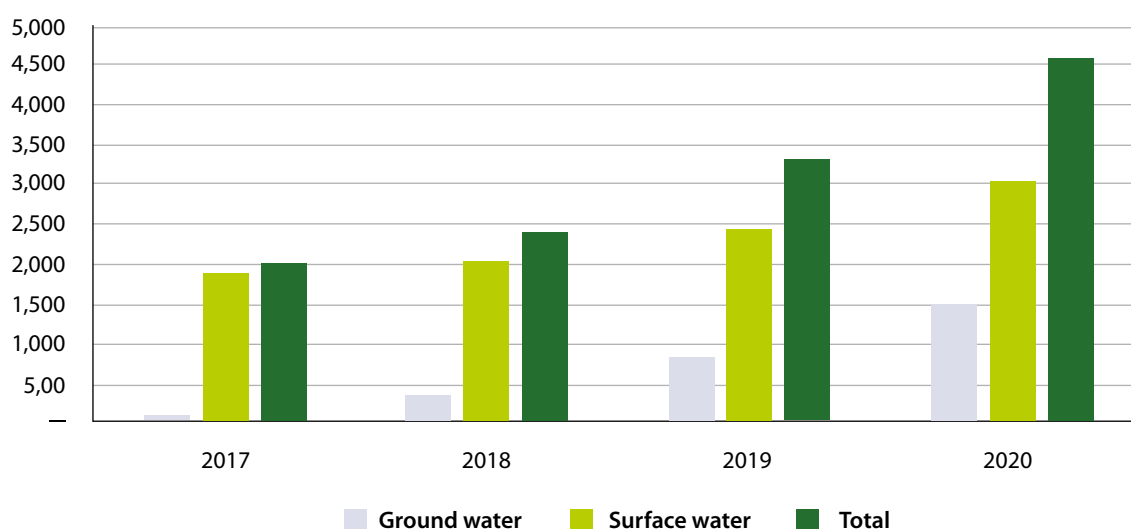
Data from the Fogera District Office of Agriculture indicates a considerable increase in the total number of water motor pumps among smallholder rice farmers for irrigation purposes. As indicated in Figure 2, the total number of water motor pumps for both surface and groundwater pumping for irrigation increased from 2,010 in 2017 to 5,588 in 2020.

The use of motor pumps demands timely availability of fuel and maintenance services for smallholder rice farmers who are located in rural areas with limited transport infrastructure. In Ethiopia, fuel stations are located in urban areas and there are frequent shortages. This forces farmers to come to urban areas to buy fuel for their motor pumps and wait for long periods of time in queues, incurring additional costs and time spent in the town. With a lack of information about current prices, farmers are also often charged higher fuel prices due to misinformation. Lack of timely maintenance of motor pumps was also reported as a challenge due to limited maintenance services, even in nearby towns, and a lack of professionalism of available services both in terms of customer care but also limited ability/skill to maintain the pumps.

4 Vegetable marketing practices and emerging trends

Given the limited tradition in vegetable production for markets (vegetables have traditionally only been produced for household consumption), rice farmers in Fogera Plain are facing a number of constraints to becoming profitable. One challenge is: poor post-

Figure 2 The number of water motor pumps owned by smallholder rice farmers in Fogera district



Source: Fogera District Office of Agriculture

harvest and marketing techniques. For example, the only post-harvest activity farmers perform is bagging for ease of transport.

Inefficient transportation systems and a lack of information about transport costs also hinder farmers from negotiating transport service fees (Adgo, 2008). In terms of product transportation to market centres (district towns), there are three ways in which vegetables are transported. The first and most frequent way is by transporting bagged vegetables using donkeys; the second involves men and women manually carrying the produce. The third way is using lorries, locally known as ISUZU trucks, particularly if the product is sold at the farm gate. Larger volumes of vegetables sold at the farm are facilitated by *delalas*, or middlemen who act on behalf of the wholesalers.

Due to the challenges farmers face related with the lack of market information systems, limited access to transport services, and their own poor marketing skills, the price setting of vegetables is totally dictated by the *delalas* and wholesalers.

Public market-related services are practically non-existent in the Fogera Plain. Though public services were expected to be provided by experts from the Ministry of Agriculture, the extent of engagement in this regard has been very low. Farmer cooperatives and their unions were also expected to address the challenges of agricultural marketing through group action, however there are currently no cooperatives engaged in facilitating product marketing in the Fogera Plain. However, there are success stories of cooperatives and their unions facilitating better marketing access. For example, the Meki-Batu union, found in the East Shewa zone of Oromia region, not

only markets locally-produced vegetables, but also exports them.

Vegetable marketing for the 2020/21 production season in the Fogera Plain has been even more challenging given the fall in prices, and limited public intervention to support smallholder farmers. The price of onion, which is one of the main vegetables produced in the Fogera Plain, has dropped to 1 ETB/kg, from about 6 ETB/kg in 2017.

5 Smallholder farmers' response to the collapse of the vegetable market

For rice farmers engaged in rice production, vegetables are produced based on the production season of rice. Accordingly, vegetable planting starts in November, immediately after the rice harvest, and continues until February. This enables farmers to begin harvesting their vegetables in March through to May and early June, when rice planting starts.

The prevailing farmgate price of most vegetables is reported to be far lower than the cost of production. A previous study reported that the cost of onion production in the Fogera district was on average 3.42 ETB/kg and the unit price was 6.14 ETB/kg, giving a profit margin of 2.72 ETB/kg in the 2017 production season (Melese and Reddy, 2017). However, farmers have faced an increase in the cost of production, and the unit farmgate price of onion in 2021 (March–June) was in the range of 1–2 ETB/kg. This has resulted in huge losses to rice farmers engaged in onion production. To minimise the extent of additional losses due to the costs of onion harvesting in 2021, rice farmers ploughed their onion fields without harvesting the onions so that the fields would be ready for rice production.

Figure 3: Smallholder rice farmers queuing at a fuel station, Woreta city



Source: Tirhas Kinfe

Figure 4: Onion field ploughed without harvesting in preparation for rice production, Fogera district



Source: Tirhas Kinfe

6 Implications for livelihood improvement among smallholder rice farmers

The observed collapse of the vegetable market emanates from the overall lack of governance of the commercialisation of the agricultural sector (related to changes in the farming system, including the emergence of irrigated agriculture and vegetable production), and a lack of associated marketing system developments mainly in the Fogera Plain.

The development of the rice sector, and its commercialisation, have been driven by private initiatives, especially smallholder farmers and rice processors that have managed to capture the opportunities the crop offered following its introduction. Many farmers also used this increased income to invest outside of the rice sector, for example in hospitality services (Alemu et al., 2019). This has resulted in little development by actors such as the government and development partners. Limited attention has therefore been given to enhancing the availability of improved technologies (certified seed, chemicals, pre-harvest, harvest and post-harvest technologies), building the required skills and knowledge of smallholders and processors, modernising and improving the marketing system (market information system, market infrastructure, marketing skills and knowledge etc), and the creation of a system of enforcement to ensure adherence to existing rules, regulations and procedures.

These shortcomings have resulted in the reduced engagement of relevant public organisations in addressing emerging and dynamic challenges in the collapse of

the vegetable price in a timely manner. These failings have also resulted in the bankruptcy of smallholder rice producers engaged in vegetable production in the Fogera Plain, while urban dwellers in the country are paying higher prices for vegetables. For instance, the price of onions in Addis Ababa during the period of March–June 2021 has been in excess of 15 ETB/kg.

This study has estimated the extent of loss and bankruptcy among rice farmers engaged in onion production using data from the Fogera District Office of Agriculture. There were a total of 6,169 farm households engaged in onion production in the 2020/2021 production season, of which 6,057 were male-headed and 112 were female-headed, with 2,005ha of land allocated for onion production. Assuming the same cost of production as in 2017 (Melese and Reddy, 2017) for the 2020/21 production season, the average loss for each household is about 8,520 ETB.

7 Conclusion

Rice production, and its commercialisation, has considerably contributed to the emergence of improved livelihood options for smallholder farmers in the Fogera Plain. In addition, as income increased, rice farmers have diversified their livelihoods, mainly through engagement in vegetable production during the off-season after rice is harvested. This has further boosted household income. However, the recent collapse of vegetable prices have resulted in a loss of investment and income for rice farmers engaged in vegetable production. This has resulted in farmers ploughing their vegetable fields – mainly onion fields – without harvesting the vegetables to avoid the additional loss of investing in onion harvesting.

Table 1 Estimation of losses from onion production: Fogera district (2021)

Classification method	Overall accuracy (%)
Total area (ha) allocated for onion	2,005
Total number of households (HHDs) (onion producers)	6,169
Average area in ha/HHD	0.33
Total average cost/HHD	15,173.87
Average production/HHD	44.36
Breakeven (ETB/kg)	3.42
Total loss (ETB/HHD)	15,173.87
Total loss if sold at the max selling price (1.5 ETB/kg)	8,520.22

Source: Fogera District Office of Agriculture

If rice farmers' efforts to transform their livelihoods are to be sustained, emerging dynamic challenges require urgent attention. In this regard, we recommend:

1. That the public sector explore short- and long-term measures in addressing vegetable marketing challenges at local and national levels. This can include: (i) the development of a national vegetable marketing information system, (ii) the consideration of introducing vegetable crops in the Ethiopian Commodity Exchange (ECX) marketing platform, (iii) the enhancement of contract farming, especially in linking with the already established integrated agro-industry parks and emerging supermarket networks, and (iv) facilitate in modernisation of the vegetable value chain (construction of cold chains, for example).
2. Building the marketing capacity of smallholder rice farmers engaged in vegetable production and marketing: (i) organising smallholder farmers in groups or cooperatives to promote collective actors, (ii) strengthening their marketing skills, including financial literacy, through relevant trainings, and (iii) facilitating access to finance for investment in required facilities such as proper packaging and weighing.
3. Enhancing access to fuel, taking into consideration the rural context, along with the introduction and promotion of environmentally-friendly technologies like solar pumps.
4. Enhancing ease of access to professional maintenance services for motor pumps. This can be through business incubation and by creating business opportunities for youths.

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Alemu, D. and Kinfe, T. (2021) *Responses of Rice Farmers Engaged in Vegetable Production: Implications of the Collapse of Vegetable Prices in the Fogera Plain*, APRA Research Note 4, Brighton: Future Agricultures Consortium

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ISBN: 978-1-78118-834-7

DOI: 10.19088/APRA.2021.017



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Funded by



This report is funded with UK aid from the UK government (Foreign, Commonwealth & Development Office – FCDO, formerly DFID). The opinions are the authors' and do not necessarily reflect the views or policies of IDS or the UK government.

